

**DII.3003.DEC40.Kernel.IG-1**

**Defense Information Infrastructure (DII)**

**Common Operating Environment (COE)**

**Kernel Installation Guide (Digital UNIX 4.0)**

**Version 3.0.0.3**

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## Preface

[HELVETICA FONT]	Used to indicate keys to be pressed. For example, press [RETURN].
Courier Font	Used to indicate entries to be typed at the keyboard, UNIX commands, titles of windows and dialog boxes, and screen text. For example, type the following command:  <pre>tar xvf /dev/rmt/3mn</pre>
“Quotation Marks”	Used to indicate prompts and messages that appear on the screen.
<i>Italics</i>	Used for emphasis.

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# 1. Introduction

## 1.1 Overview

This document provides information and guidance needed for proper installation of the Digital UNIX Version 4.0 Operating System and the Defense Information Infrastructure (DII) Common Operating Environment (COE) Kernel Version 3.0.0.3.

The DII COE contains a large number of functional blocks called segments; however, not all segments are required for every application. The DII COE *Kernel* is the minimal set of software required on every workstation regardless of how the workstation will be used. The DII COE Kernel includes the following features:

- C Operating system
- C Windowing environment
- C System Administration function
- C Security Administration function
- C Runtime tools
- C Commercial off-the-shelf (COTS) software [including desktop graphical user interface (GUI) and windowing environment]
- C Government off-the-shelf (GOTS) software.

The System Administration segment is required because it contains the software needed to load all other segments. The GUI is required because it is the interface through which an operator issues commands to the system. The GUI is an icon-driven and menu-driven desktop interface, not a command line interface. The templates included in the DII COE Kernel describe the basic runtime environment context that an operator inherits upon login (e.g., which processes are run in the background or which environment variables are defined). The DII COE Kernel ensures that every workstation in the system operates in a consistent manner and that every workstation begins with the same environment.

From an installation sequence perspective, it is necessary to define a subset of the DII COE Kernel called the bootstrap DII COE. Segments are installed through a special DII COE program called the segment installation tool, which is accessed as a system administration function. However, the segment installation tool itself must be installed before it can be used to install segments. Moreover, COTS software is typically not in segment format.

How then is the segment installation tool, as well as at least a minimum operating system, installed to permit the DII COE Kernel to be loaded? This is done by first loading the operating system and windowing environment, then by loading the DII COE segment installation software. Once the DII COE is thus “bootstrapped,” it is possible to load the remaining components of the DII COE Kernel and any additional segments.

Figure 1 shows a more detailed notional depiction of the process. The user is responsible for installing the operating system and windowing environment, the DII COE, which contains operating system modifications to support DII, the desktop GUI, the COE, System Administration, and Security Administration.

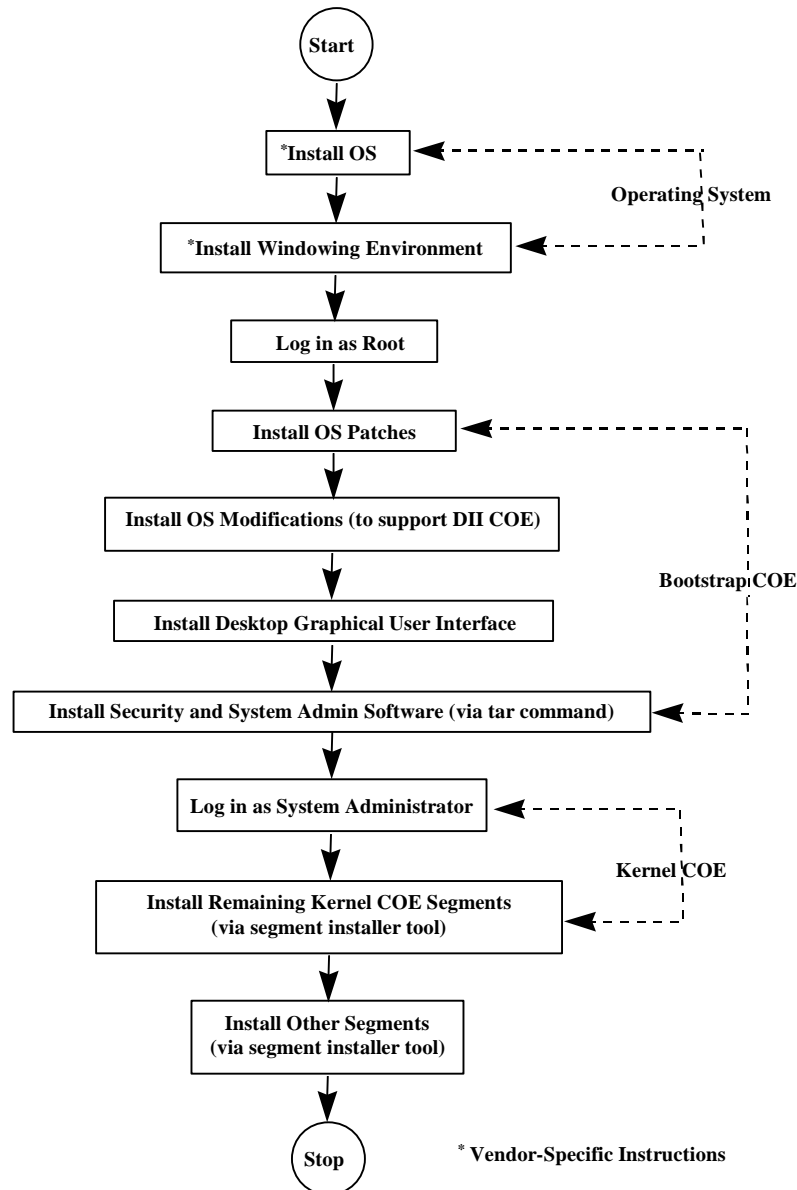


Figure 1. Notional DII COE Kernel Installation



This installation approach has several advantages: (1) It greatly simplifies the installation process; (2) it guarantees a standard starting configuration for all platforms regardless of how they will be used; and (3) it allows all remaining segments to be loaded in a standard way regardless of the hardware platform or mission application, thus simplifying system administration. Through the COE, segments may extend the base environment as required as they are loaded.

## **1.2 Installation Process**

During the Digital UNIX Version 4.0 installation process, an installation Kernel is booted from the Digital UNIX CD-ROM. Your system disk is partitioned and the new system is configured using the installation media. Once the configuration is complete, a new fully functional Digital UNIX operating system is loaded from the Digital UNIX CD-ROM onto your system disk.

The DII COE Kernel tape is then installed. The DII COE Kernel provides the desktop GUI and the DII COE Security and System Administration software.

## **1.3 Additional Sources of Information**

Reference the following documents for more information about the DII COE:

- C *Defense Information Infrastructure (DII) Common Operating Environment (COE) Integration and Runtime Specification* Version 2.0, DII COE I&RTS:Rev 2.0, Inter-National Research Institute, October 23, 1995
- C *Defense Information Infrastructure (DII) Common Operating Environment (COE) Version 3.0.0.3 Programming Guide (Digital UNIX 4.0)*, DII.3003.DEC40.PG-1, Inter-National Research Institute, December 10, 1997
- C *Defense Information Infrastructure (DII) Common Operating Environment (COE) System Administrator's Guide (HP and Solaris) FINAL* Version 3.0.0.3, DII.3003.Final.UNIX.AG-1, Inter-National Research Institute, October 29, 1996.

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## 2. System Environment

### 2.1 System Requirements

This section describes DII COE hardware components, Digital UNIX Operating System components, and DII COE Kernel components for the Digital UNIX Operating System.

#### 2.1.1 Hardware Components

The following hardware components are required. The software may reside on a single disk or across multiple disks.

- C **DEC Alpha.** A DEC Alpha processor or single-board computer.
- C **Memory.** At least 64 megabytes (MB) of random access memory (RAM).
- C **Hard disk drive.** Recommend 1.2 gigabyte (GB) or larger capacity.
- C **Source devices.** A CD-ROM drive to load the operating system; a 4mm tape drive to load the DII COE software.

The following hardware components are optional:

- C Floppy disk drive
- C Cartridge tape drive
- C 8mm Exabyte tape drive
- C Audio card.

#### 2.1.2 Operating System Component

The following Digital UNIX Operating System component is required:

- C Digital UNIX CD-ROM labeled *Digital UNIX V4.0 Operating System Volume 1, May 1996*, which contains Digital UNIX Version 4.0.

### **2.1.3 Kernel Components**

The DII COE Kernel (Digital UNIX Version 4.0) tape is required. The DII COE Kernel is a suite of applications layered on top of the Digital UNIX Operating System. The DII COE Kernel tape contains software relating to the following areas:

- C Operating system modifications
- C Administration software required for installation and for System and Security Administration
- C X Windows software
- C Motif software
- C Common Desktop Environment (CDE) software.

## **2.2 Digital UNIX Installation Preparation**

The following questions must be answered before you install the Digital UNIX Operating System and the DII COE Kernel. Your system administrator should provide you with the appropriate answers.

### **2.2.1 Digital UNIX Version 4.0 Operating System Installation Preparation**

Answer the following questions before installing Digital UNIX Version 4.0.

1. How much swap space will be required to support all of your applications?
2. What is the host name of the system?

**NOTE:**

1. The name of the system can be found by typing the following command at a prompt:

```
/usr/bin/uname -n [RETURN]
```

The name of the system is displayed.

2. The name of the system can be found if you know the Internet Protocol (IP) address of the system. Type the following command at a command line prompt. This command only works if the Domain Name Service (DNS) has been configured.

```
/usr/sbin/nslookup [IP address][RETURN]
```

For example, if the IP address of the system is "123.456.789.123", type the following command:

```
/usr/sbin/nslookup 123.456.789.123 [RETURN]
```

Information similar to the following appears:

```
Server:  myserver
Address: 123.123.123.123
```

```
Name:    mysystem
Address: 123.456.789.123
```

where `myserver` is the name server, `123.123.123.123` is the IP address of the name server, and `mysystem` is the name of the system.

3. What is the password for the `root` administrative account? This password is required to log in to the system and is specified in Section 3.3, *Configuring Digital UNIX*.

---

4. What is the IP address of the system?

**NOTE:**

1. If you know the name of the system (e.g., `mysystem`) but do not know the IP address of the system, type the following command at a command line prompt:

```
/sbin/cat /etc/hosts[RETURN]
```

After you type this command, information similar to the following appears:

```
127.0.0.1      localhost
123.456.789.123  mysystem
```

The line that contains the name of the system being configured also includes the system's IP address.

2. If you know the name of the system but do not know the IP address of the system, type the following command at a command line prompt. This command only works if DNS has been configured.

```
/usr/sbin/nslookup [host name][RETURN]
```

For example, if the name of the system is “mysystem”, type the following command:

```
/usr/sbin/nslookup mysystem[RETURN]
```

Information similar to the following appears:

```
Server:  myserver
Address: 123.123.123.123

Name:     mysystem
Address: 123.456.789.123
```

where `myserver` is the name server, `123.123.123.123` is the IP address of the name server, and `123.456.789.123` is the IP address of the system.

5. What is the netmask IP address for your system?

## 2.2.2 DII COE Kernel Tape Installation Preparation

Answer the following questions before installing the DII COE Kernel tape.

1. Does the system have an internal tape drive? If so, what is the tape device number?
2. Is an external tape drive attached to the system? If so, is the tape device number set to 5?

<p><b>NOTE:</b> The SCSI tape device <i>must</i> always be set to 5. If it is set to any number other than 5, the system may panic.</p>
---

3. What is the password for the System Administration (`sysadmin`) account?
4. What is the password for the Security Administration (`secman`) account?

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### 3. Digital UNIX Operating System Installation

#### 3.1 Determining If Your Installation Is Graphical or Text Based

Two user interfaces are available for the Digital UNIX installation process: A graphical interface or a text-based, menu-driven interface. The type of installation is determined automatically based on your hardware configuration and the amount of memory on your system. Systems with graphical consoles and at least 32 MB of memory have a graphical interface to the installation. Systems with consoles that do not have graphics capabilities or have less than 32 MB of memory have a text-based interface. Both interfaces have the following characteristics:

- C All questions are asked and answered before the system is changed in any way.
- C Free disk space is calculated and displayed automatically during software selection.
- C Software subset dependencies are checked and resolved automatically.
- C Online help is available.
- C A UNIX shell is available to access UNIX commands and utilities before and during the installation process. The UNIX shell also can be used to boot the system for disaster recovery and maintenance purposes.

**NOTE:** Because 64 MB of RAM is specified as the memory requirement in Section 2.1.1, *Hardware Components*, this installation guide does not describe how to perform a text-based installation.

#### 3.2 Booting From the Digital UNIX CD

The Digital UNIX Operating System must be loaded from CD-ROM. The following steps detail the full installation of the operating system.

**NOTE:** The prompts, menus, and menu items displayed below are representative and may not reflect the actual prompts and menu items verbatim.

**NOTE:** This automated installation procedure is called a *destructive installation* because the installation removes any previously installed software. Your disk *will* be overwritten as part of the installation process and all data will be lost. If you must save any data currently on the system, you should back it up before you proceed.

Follow the steps below to boot from the Digital UNIX CD.

**STEP 1: Log in.** Log in as `root` and enter your `root` password. A command prompt appears.

**NOTE:** If the native CDE is loaded on the machine, log in as `root` at the Login window and enter your `root` password. Open a terminal emulator window from the CDE Front Panel before proceeding to STEP 2. To open a terminal emulator window, double-click on the Terminal control from the Text Editor—Personal Applications control subpanel.

Reference the *DII COE System Administrator's Guide (HP and Solaris)* for more information about the CDE Front Panel.

**STEP 2: Halt the system.** Type the following command to halt the system:

```
/usr/sbin/shutdown -h now[RETURN]
```

The system shuts down and a console mode prompt (`>>>`) appears.

**STEP 3: Attach the CD-ROM drive to the system.** Attach a CD-ROM drive to the system if one is not already attached. Before attaching the CD-ROM drive, turn off the machine. Once the CD-ROM drive is attached, power up all peripherals and, lastly, the Central Processing Unit (CPU).

**STEP 4: Place the CD in the CD-ROM drive.** Place the CD labeled *Digital UNIX V4.0 Operating System Volume 1, May 1996*, in the CD-ROM drive or, if necessary, place the CD in a caddy and then insert the caddy into the CD-ROM drive.

**STEP 5: Set appropriate console flags and variables.** Before booting the machine from the console mode (`>>>`), several boot level flags must be set. These flags are specific to the hardware architecture you have and are defined in Appendix A, *Processor-Specific Environment Variables and Console Flags*.

**NOTE:** These flags *must* be set before you boot the machine.

Reference Appendix A for the steps you must follow to set console flags and variables for the following DEC Alpha machines:

- C AlphaPC64, EB64+, EB66+, and EB164 SBCs
- C AlphaServer 400 Series Processors
- C AlphaServer 1000 and AlphaServer 1000A Series Processors
- C AlphaServer 2000 Series Processors
- C AlphaServer 2100 Series Processors, AlphaServer 2100A Series, and Digital Alpha VME 2100 Series Processors
- C AlphaServer 8200 and AlphaServer 8400 Series Processors
- C AlphaStation 200 Series and AlphaStation 400 Series Processors
- C AlphaStation 250 Series and AlphaStation 255 Series Processors
- C AlphaStation 500 and AlphaStation 600 Series Processors
- C AXPvme 64, AXPvme 100, AXPvme 160, AXPvme 166, and AXPvme 230 Single-Board Computers (SBCs)
- C AXPpci 33 SBCs
- C DEC 2000 Series Processors
- C DEC 3000 Series Processors
- C DEC 4000 Series Processors
- C DEC 7000 and DEC 10000 Series Processors.

**STEP 6: Boot the machine.** Type the following command to initialize the commands:

```
init [RETURN]
```

**STEP 7: Determine the device name for the CD-ROM.** Type the following command from the console mode (>>>) to determine the device name for the CD-ROM (device names will differ depending on the hardware platform):

```
show device[RETURN]
```

A device table similar to the following appears:

dka0.0.0.6.0	DKA0	RZ28M	0568
dka100.1.0.6.0	DKA100	RZ28M	0568
dka400.4.0.6.0	DKA400	RRD45	0436
dva0.0.0.0.1	DVA0		
ewa0.0.0.0.12.0	EWA0	00-00-F8-20-C1-4B	
pka0.7.0.6.0	PKA0	SCSI Bus ID 7	

The second column shows the device names assigned to each drive. The letters **DK** refer to a SCSI disk or a CD-ROM drive. The letters **RRD**, appearing in the third column, are a CD-ROM device string. In the device table above, then, the device name for the CD-ROM is **DKA400**.

**STEP 8: Boot from the CD-ROM.** Type the following command to boot from the CD-ROM:

```
boot [device name][RETURN]
```

In the example above, [device name] would be **DKA400**.

The system boots from the CD-ROM drive.

**NOTE:** Booting from the CD-ROM takes about 5-10 minutes, depending on the speed of your processor.

### 3.3 Configuring Digital UNIX

**STEP 1: Prepare to provide user input for a customized installation.** After your system is booted, either a graphical user interface (GUI) window or a text-based screen appears.

**NOTE:** Because 64 MB of RAM is specified as the memory requirement in Section 2.1.1, *Hardware Components*, this installation guide does not describe how to perform a text-based installation.

If your system console has graphics capability and 32 megabytes (MB) or more of memory to support a graphic installation, the X Server is started and the Installation Setup screen appears (Figure 2).

Installation Setup							
Install Type:	<u>Default</u>			Date:	<u>__-__-__</u> (mm-dd-yy)		
Host Name:	<u>                    </u>			Time:	<u>__:__</u> (hh:mm 24 hr format)		
Root Password:	<u>                    </u>			Location:	<u>US</u>		
Verify Password:	<u>                    </u>			Time Zone:	<u>Eastern</u>		
Device, Partition, and File System Selection:							
	Device Name	Partition	File System Type	Disk Type	Disk Number	Controller Type	Controller Number
root:	rz0	a	UFS	RZ28M	0	SCSI	0
Setup Done		View Software...		Partition Disks...		UNIX Shell...	
						Help	

Figure 2. Installation Setup Screen

**NOTE:** The graphical installation interface provides access to a UNIX shell. This allows you to perform disk and file system maintenance before the installation. If you are using the graphical interface, you can access the UNIX shell from the `UNIX Shell...` button. This option puts your system into a Bourne shell in single-user mode with superuser privileges. To restart the installation procedure for the UNIX shell, type `restart` and press [RETURN]. It is recommended that only experienced users choose the UNIX shell option.

**NOTE:** Click on the `Help` button to display online help.

**NOTE:** Default responses have been provided in fields where an entry is required.

**NOTE:** With the exception of the `Root Password`, `Date`, and `Time` fields, you can enter the information in the `Installation Setup` screen in any sequence. When you specify a password in the `Root Password` field, you must validate the password by entering it again in the `Verify Password` field. When you enter information in either the `Date` or `Time` field, you must enter information in the other field as well.

**STEP 2: Choose to customize the installation.** A custom installation is an installation that allows you to customize the file system layout and select optional software to install. Select `Custom` from the `Install Type` toggle. Several rows are added to the `Device, Partition, and File System Selection` panel: `usr`, which is the `/usr` file system; `var`, which is the `var` directory (located under `/usr`); and `swap1` and `swap2`, which are swap areas.

**STEP 3: Specify a host name for the system.** The host name identifies the system on the network. Click on the `Host Name` field and enter a host name (e.g., `mysystem`).

**NOTE:** The host name must be unique within the domain in which it resides. Creating a duplicate host will cause network problems after you install Digital UNIX. A host name should contain no more than eight characters and can contain letters, numbers, underscores (`_`), or hyphens (`-`). A host name must start with a letter. Uppercase letters are not recommended. See your system administrator before choosing your host name.

**STEP 4: Specify the root password for the system.** Click on the `Root Password` field, enter a root password, and press `[RETURN]`.

**NOTE:** Passwords should contain a combination of uppercase and lowercase letters and no more than eight characters. The password cannot be all lowercase and must have at least one capital letter or at least one numeral. Digital suggests that you use numbers and special characters, such as the dollar sign (`$`), the percent sign (`%`), the number sign (`#`), the period (`.`), the hyphen (`-`), the underscore (`_`), or the “at” sign (`@`) in your password. See your system administrator before choosing your `root` password.

**STEP 5: Verify the root password.** Click on the `Verify Password` field, retype the `root` password, and press `[RETURN]`.

**STEP 6: Enter the date.** Click on the first of the three `Date` fields. Enter the date in the three fields in the format `mm-dd-yy`, where `mm` represents the month, `dd` represents the day, and `yy` represents the year. You can `[TAB]` between the fields.

**STEP 7: Enter the time.** Click on the first of the two `Time` fields. Enter the time in the two fields in digits using the 24-hour clock in the format `hh:mm`, where `hh` represents the hour and `mm` represents the minutes. You can `[TAB]` between the fields.

**STEP 8: Change the default location, if necessary.** The default location that appears on the `Location` toggle is `US` (United States). Click on the `Location` toggle if you need to change the default location. A scroll list of locations appears. Click on the appropriate location to select it. The newly-selected location now appears on the `Location` toggle.

**STEP 9: Change the time zone, if necessary.** The default time zone that appears on the `Time Zone` toggle is `Eastern`. Click on the `Time Zone` toggle if you need to change the default time zone. A scroll list of time zones appears. Click on the appropriate location to select it. The newly-selected location now appears on the `Time Zone` toggle.

**STEP 10: Review the Device, Partition, and File System Selection panel.** The panel appears as follows (Figure 3):

	Device Name	Partition	File System Type	Disk Type	Disk Number	Controller Type	Controller Number
root:	rz0	a	UFS	RZ28M	0	SCSI	0
usr:	rz0	g	UFS	RZ28M	0	SCSI	0
var:	in /usr						
swap1:	rz0	b		RZ28M	0	SCSI	0
swap2:	not used						

Figure 3. Device, Partition, and File System Selection Panel

**STEP 11: Make sure disk rz0 contains the root, usr, and swap file systems.** Disk `rz0` *must* be selected as the `Device Name` for the `root`, `usr`, and `swap` file systems. If it is not, click on the `Device Name` toggle and select `rz0` for all systems.

**STEP 12: Choose to configure the partition sizes.** Click on the `Partition Disks...` button from the bottom of the `Installation Setup` screen to configure the disk partition sizes. The `Device Selection for Partitioning` window appears.

**STEP 13: Choose to partition the rz0 disk.** Click on the row that contains `rz0` in the `Device Name` column to select that disk. Click on the `OK` button to select the `rz0` disk to partition.

**STEP 14: Review the disk partition information.** The `Configure Partitions` window appears (Figure 4). This window lists information about the disk partitions, including the device name, disk type, controller type, label, total disk size, and partitions used.

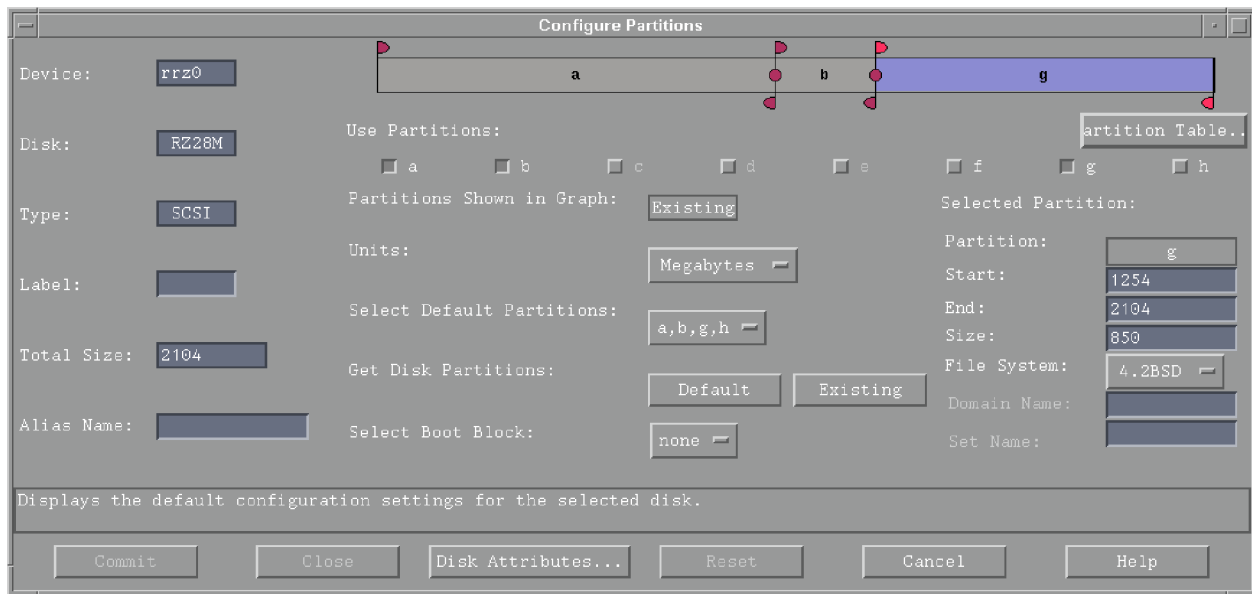


Figure 4. Configure Partitions Window

**STEP 15: Choose to view the partition sizes in MB.** Select Megabytes from the Units toggle in the Configure Partitions window to view the partition sizes in MB. The Units toggle is located in the middle column.

**STEP 16: Determine your disk size.** DEC Alpha systems must have three partitions: a, b, and g. The a, b, and g partitions are different sizes depending on the size of the disk being partitioned. The size of your disk appears in the Total Size field in the Configure Partitions window. The following table shows the appropriate partition sizes for the a, b, and g partitions for a 2104 MB disk and a 4290 MB disk.

Disk Size	a	b	g
2104 MB disk	1002 MB	252 MB	850 MB
4290 MB disk	2075 MB	515 MB	1700 MB

Table 1. Disk Partition Sizes

**STEP 17: Make sure that only the a, b, and g partitions will be configured.** The partitions being configured appear in the partition rectangle at the top of the Configure Partitions window. The a, b, and g partitions are the DEC Alpha default selections, which means that the toggles for a, b, and g already should be clicked on in the Use Partitions section of the window. If any other partitions appear in the partition rectangle besides a, b, or g, remove them by clicking on the toggle next to the letter of the invalid partition in the Use Partitions section of the window. Figure 4 only shows the a, b, and g partitions.



**STEP 18: Configure the g partition size.** Click on the g box in the partition rectangle to activate the g partition if it is not already activated.

**NOTE:** Activating a partition box turns the box blue.

Move the red marker on the bottom of the box all the way to the right. You should note the numbers changing in the `Selected Partition` section of the window. The `End` field in the `Selected Partition` section should equal your disk size as shown in the `Total Size` field. To change the size, click on the circle between the b and g partitions. Drag this circle to the left until the number in the `Size` field equals the appropriate size as shown in Table 1.

**STEP 19: Configure the b partition size.** Click on the b box in the partition rectangle to activate the b partition. Drag the circle between the a and b partitions to the left or the right until the number in the `Size` field equals the appropriate size as shown in Table 1.

**STEP 20: Configure the a partition size.** Click on the a box in the partition rectangle to activate the a partition. The number in the `Size` field should equal the appropriate size as shown in Table 1.

**STEP 21: Commit your changes.** Click on the `Commit` button at the bottom of the window to commit your changes. The `Commit Information` dialog box appears. This dialog box contains information about the partition changes you made to the rz0 disk. The actual text will vary depending on your system's disk label. The text should begin with a message similar to the following:

```
Disk Configuration may change information on the disk,
/dev/rrz0.
```

The text may contain a message similar to the following followed by a table listing overlapping partitions:

```
You are requesting changes that will result in overlapping
partitions containing file systems. This may result in
corrupted data.
```

The text may contain a message similar to the following followed by a table listing affected partitions.

```
You are requesting changes in size or position of
partitions containing file systems. This may result
in lost or corrupted data. File systems will
automatically be re-created.
```

The text should end with a message similar to the following:

```
Do you want to commit all changes, ok or cancel?
```

Review the information and click on the `OK` button to commit all changes.

**STEP 22: Acknowledge an error message.** If an error message appears, click on the `OK` button and proceed to STEP 23. If an error message does not appear, proceed to STEP 24.

**NOTE:** If you have configured the partitions exactly as described in STEPS 17 through 22, you may receive system error messages. These messages may state that you have made configuration errors even though you have not. You should repeat STEPS 17 through 22 again (or possibly two more times), as described in STEP 23, until you receive the following message, which is shown in STEP 21:

```
Do you want to commit all changes, ok or cancel?
```

After you repeat STEPS 17 through 22 one or two more times, the system will accept your configuration changes.

**STEP 23: Configure partition sizes again.** The `Configure Partitions` window returns to the forefront. Repeat STEPS 17 through 22.

**STEP 24: Exit from the Configure Partitions window.** If you do not receive an error message and the `Configure Partitions` window returns to the forefront, the system has accepted your configuration changes. Click on the `Close` button to exit from the `Configure Partitions` window.

**STEP 25: Choose to view optional software subsets.** The `Installation Setup` screen returns to the forefront. Click on the `Select Software...` button to view optional software subsets.

**STEP 26: Review the message about verifying partition sizes.** The `Modified Disk Label` dialog box appears with the following message:

```
The existing partition table on rz0 does not match the
default partition table. You may want to verify the partition
sizes before proceeding.
```

Click on the `OK` button to acknowledge the message. The following screen then appears:

```
Determining the Mandatory subsets for the chosen
configuration... Please wait
```

**STEP 27: Select optional software subsets to be installed.** The Software Selection window appears. This window has two main panels: Available Software and Selected Software. The Available Software panel contains a scroll list of software subset categories and software subsets from which you can choose. The Selected Software panel contains a scroll list of mandatory software subset categories and software subsets.

Scroll through the Available Software list and highlight the Additional Networking Services subset, which is located under the Network-Server/Communications software subset category. Click on the Add button. Then highlight the Remote Installation Services software subset, which is also located under the Network-Server/Communications software subset category. Click on the Add button. Both subsets move to the Selected Software panel.

Scroll through the Available Software list and highlight the C2-Security subset, which is located under the System Administration software subset category. Click on the Add button. Then highlight the C2-Security GUI software subset, which is also located under the System Administration software subset category. Click on the Add button. Both subsets move to the Selected Software panel.

**NOTE:** When you select optional software subsets, the amount of free space remaining in the root and /usr file systems is displayed and updated as you select each optional software subset to indicate if the disk partitions you chose are large enough to hold the software you are selecting. The amount of free space remaining is displayed in the File System Status fields at the bottom of the Software Selection window.

Click on the OK button at the bottom of the Software Selection window.

**STEP 28: Verify your disk, partition, and software selections.** The Installation Setup window reappears. Verify the accuracy of all the information you have input and change any information if necessary. Click on the Setup Done button at the bottom of the window to accept all changes and exit the window.

## 3.4 Installing Digital UNIX

**STEP 1: Indicate that you are ready to begin the installation.** The Ready to Begin Installation dialog box appears with the following message:

```
The installation process is now ready to begin. When you click
on "OK" below the configuration will be saved, the screen will
go blank and the installation will proceed. Following
installation, you will be prompted to enter some boot
information and then instructed to reboot the system. After the
system has rebooted, use the CDE Login screen to log in as root
and continue with system configuration.
```

Click on the OK button to begin the installation. The following message appears:

```
Saving Configuration... Please wait.
```

**STEP 2: Review file system creation messages.** When the installation procedure starts, the root, /usr, and swap file systems are created on the disk with the partitions you have selected. Messages similar to the following appear:

```
Continuing installation...

*** Creating the root file system on device rz0a ***

*** Creating the usr file system on device rz0g ***

*** Creating the swap1 file system on device rz0b ***
```

**STEP 3: Review messages about the software subsets.** Software subsets are loaded after the file systems are created. Messages similar to the following appear:

```
*** Loading the operating system software subsets ***

The installation procedure will now load the software on your
disk partitions. This process will take from 45 to 120 minutes
to complete depending on your distribution media and processor
type.

Checking file system space required to install specified
subsets:

File system space checked OK.

34 subset(s) will be installed.
```

The 34 subsets are loaded. Installation takes between 20 minutes and 2 hours, depending on the number of subsets selected and the system speed. Messages similar to the following appear:

```
Loading 1 of 34 subset(s)....

Base System
  Copying from /ALPHA/BASE (disk)
    Working....Tue Jan 21 15:02:43 EST 1997
    Working....Tue Jan 21 15:04:47 EST 1997
  Verifying
    Working....Tue Jan 21 15:06:31 EST 1997
    .
    .
    .
34 of 34 subset(s) installed successfully.
```

**STEP 4: Enter the appropriate boot commands.** A message similar to the following appears:

Issue the following console commands to set your default bootpath variable and to boot your system disk to multiuser:

```
>>> set boot_osflags A
>>> set bootdef_dev DKA0
>>> boot

syncing disks... done
CPU 0: Halting... (transferring to monitor)
```

The `set boot_osflags A` command tells the hardware to boot the machine to multi-user mode. The `set bootdef_dev DKA0` command tells the hardware to boot from the device defined as DKA0, which is `/dev/rz0`. The `boot` command boots the machine. Enter the following boot commands at the console mode prompt (`>>>`):

```
set boot_osflags A[RETURN]

set bootdef_dev DKA0[RETURN]

boot [RETURN]
```

System configuration begins after the system boots. A Kernel build procedure begins after system configuration.

**STEP 5: Select the Kernel options that you want to install.** The `KERNEL OPTION SELECTION` menu appears.

```
*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***
```

```
*** KERNEL OPTION SELECTION ***
```

```

Selection  Kernel Option
-----
1          System V Devices
2          Logical Volume Manager (LVM)
3          NTP V3 Kernel Phase Lock Loop (NTP_TIME)
4          Kernel Breakpoint Debugger (KDEBUG)
5          Packetfilter driver (PACKETFILTER)
6          Point-to-Point Protocol (PPP)
7          STREAMS pckt module (PCKT)
8          Data Link Bridge (DLPI V2.0 Service Class 1)
9          X/Open Transport Interface (XTISO, TIMOD, TIRDWR)
10         File on File File System (FFM)
11         ISO 9660 Compact Disc File System (CDFS)
12         Audit Subsystem
13         ACL Subsystem
14         All of the above
15         None of the above
16         Help
17         Display all options again
-----
Enter the selection number for each kernel option you want.
For example, 1 3 [15]:

```

Type the following at the `For example, 1 3 [15]:` prompt to select the Compact Disc File System (CDFS) and the Audit Subsystem:

```
11 12 [RETURN]
```

**NOTE:** The ISO 9660 CDFS provides the ability to mount CD-ROMs formatted to the ISO 9660 standard or the High Sierra Group (HSG) format. The Audit Subsystem provides a security audit system configurable through the `audit_setup` command. The subset provides additional security on system features such as passwords, account ownership, and remote access.

**STEP 6: Verify the Kernel options you selected.** If you have selected the correct Kernel options, type `Y` and press [RETURN] when the following message appears; if the selected options are incorrect, type `N` and press [RETURN]. If you type `N`, the `KERNEL OPTION SELECTION` menu reappears, which allows you to reselect Kernel options.

```
You selected the following kernel options:
```

```
ISO 9660 Compact Disc File System (CDFS)
Audit Subsystem
```

```
Is that correct? (y/n) [y]:
```

**STEP 7: Choose not to edit the configuration file.** Type `N` and press [RETURN] when the following prompt appears:

```
Do you want to edit the configuration file? (y/n) [n]:
```

**STEP 8: Review the Kernel build messages.** Review the following messages about the Kernel build:

```
The system will now automatically build a kernel
and then reboot. This will take approximately 15
minutes, depending on the processor type.
```

```
When the login prompt appears after the system
has rebooted, use "root" as the login name and
the SUPERUSER password that was entered during
this procedure, to log into the system.
```

```
*** PERFORMING KERNEL BUILD ***
```

```
Working...
```

The Kernel build takes between 5-15 minutes. After the Kernel is built, the machine reboots.

**STEP 9: Remove the CD from the CD-ROM drive.** Remove the *Digital UNIX V4.0 Operating System Volume 1, May 1996*, CD from the CD-ROM drive.

To remove the CD from the drive, press the `EJECT` button on the CD-ROM drive.

**STEP 10: Proceed to the next section.** Proceed to Section 4, *DII COE Kernel Installation*, to log in to the system and install the DII COE Kernel.

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## 4. DII COE Kernel Installation

The DII COE Kernel tape provides the desktop GUI and the Security and System Administration software. Follow the steps below to install the DII COE Kernel.

**NOTE:** The Digital UNIX Operating System *must* be loaded before the DII COE Kernel can be loaded.

**NOTE:** All steps must be performed in the exact order presented to correctly install the DII COE Kernel. No steps may be skipped.

**NOTE:** This procedure takes approximately 30 minutes depending on the speed of your system.

**WARNING:** Do *not* log in to the system in STEP 3 by typing your user name in the CDE login window user name field. You *must* follow the exact procedure documented in STEP 3 in order to log in to the system or your installation will fail.

**STEP 1: Attach a tape drive to the system, if necessary.** Attach a tape drive to the system if one is not already attached.

**STEP 2: Load the Kernel tape.** Load the DII COE Kernel tape into a tape drive.

**STEP 3: Choose to log in to the system using a command line login.** If you have a graphics workstation, a CDE login window appears. Click on the `Options` button and select the `Command Line Login` option. The following message appears:

```
*****
*
*   Suspending Desktop Login...
*
*   Press [Enter] for a login prompt.
*
*   Log in. Desktop Login will resume shortly after you log out.
*
*****
```

**NOTE:** If you do not have a system console with graphics capabilities, a `login:` prompt appears. Type `root` at the `login:` prompt and type your `root` password at the `password:` prompt. Proceed to STEP 5.

**NOTE:** You must log in within 20 seconds or the CDE login window described in STEP 3 reappears. If the CDE login window reappears, return to STEP 3.

STEP 4: **Log in at the prompt.** Press [RETURN] *immediately* for a login prompt. If you wait too long, the CDE login window reappears. The following prompt appears:

Login:

Type `root` and press [RETURN].

Password:

Type your `root` password and press [RETURN].

The following message appears:

```
The installation software has successfully installed your
system.
```

STEP 5: **Extract the installation program from the tape.** Type the following command to extract the installation program from the tape:

```
tar xvf /dev/rmt0h[RETURN]
```

The following message should appear:

```
blocksize = 20
Xtmp/inst.dii, 8845 bytes, 18 tape blocks
xtmp/dii_kernel_mod_dii, 28 bytes, 1 tape blocks
```

STEP 6: **Start the installation program.** Type the following command to start the installation program:

```
/tmp/inst.dii[RETURN]
```

STEP 7: **Acknowledge the installation message.** Press [RETURN] when the following message appears:

```
*** DII Kernel Installation ***
      3.0.0.3[DEC OSF1 V4.0]
This installation will take approximately 15-30 minutes.

Press [ENTER] to continue.
```

Installation of the DII COE Kernel begins.

**NOTE:** As stated in STEP 7, the Kernel installation takes between 15-30 minutes.

**STEP 8: Enter the IP address for your system.** The following prompt appears:

Enter the IP Address for your system, then press [Enter]

Enter the IP address of your system and press [RETURN].

**NOTE:** An IP address must be unique and follow your site's address conventions or a system or network failure may result. IP addresses contain four sets of numbers between 0 and 255 that are separated by periods (e.g., 123.456.789.123). See your system administrator before choosing your IP address.

**STEP 9: Determine if the IP address you entered is correct.** The following prompt appears:

You have chosen [IP address] as the IP Address for this system.  
Is this correct?

Type **y** and press [RETURN] if the IP address is correct, or type **n** and press [RETURN] to return to STEP 8.

**STEP 10: Enter the netmask IP address for your system.** Enter the netmask IP address for your system and press [RETURN] when the following prompt appears.

Enter the NETMASK Address for your system, then press [Enter]:

**STEP 11: Determine if the netmask IP address you entered is correct.** The following prompt appears:

You have chosen [netmask IP address] as the NETMASK Address for this system.  
Is this correct?

Type **y** and press [RETURN] if the netmask IP address is correct, or type **n** and press [RETURN] to return to STEP 10.

**STEP 12: Determine if you are ready to load COE packages.** Type `y` and press [RETURN] when the following message appears:

```
Loading COE Packages ...
```

```
Please make sure your installation tape is mounted and online.  
Are you ready (y/n)?
```

The COE packages load.

**STEP 13: Determine if you are ready to load CDE packages.** Type `y` and press [RETURN] when the following message appears:

```
Loading CDE Packages ...
```

```
Please make sure your installation tape is mounted and online.  
Are you ready (y/n)?
```

The CDE packages load.

**STEP 14: Determine if you are ready to load the DII COE Operating System.** Type `y` and press [RETURN] when the following message appears:

```
Loading DIIOS ...
```

```
Please make sure your installation tape is mounted and online.  
Are you ready (y/n)?
```

The DII COE Operating System loads.

**STEP 15: Determine if you are ready to load DII CDE modifications.** Type `y` and press [RETURN] when the following message appears:

```
Loading DII CDE Modifications ...
```

```
Please make sure your installation tape is mounted and online.  
Are you ready (y/n)?
```

The DII COE modifications load.

**STEP 16: Enter and confirm a password for `sysadmin`.** The following messages appear:

```
Changing password for sysadmin
New password:
```

Type your `sysadmin` password and press [RETURN]. Retype the password and press [RETURN] at the following prompt:

```
Retype new password:
```

**NOTE:** See your system administrator before choosing your `sysadmin` password.

The following message appears:

```
Hashed database not in use, only /etc/passwd text file updated
```

**STEP 17: Enter and confirm a password for `secman`.** The following messages appear:

```
Changing password for secman
New password:
```

Type your `secman` password and press [RETURN]. Retype the password and press [RETURN] at the following prompt:

```
Retype new password:
```

**NOTE:** See your system administrator before choosing your `secman` password.

The following messages appear:

```
Hashed database not in use, only /etc/passwd text file updated
```

```
*** FINAL System shutdown message from root@[host name] ***
```

```
System going down IMMEDIATELY.
```

The system reboots and the installation is completed.

**NOTE:** A system reboot takes about 5 minutes.

**STEP 18: Proceed to the next section.** Proceed to Section 5, *Product Authorization Key Configuration*, to configure Product Authorization Keys (PAKs). PAKs *must* be loaded before performing any other system functions.

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## 5. Product Authorization Key Configuration

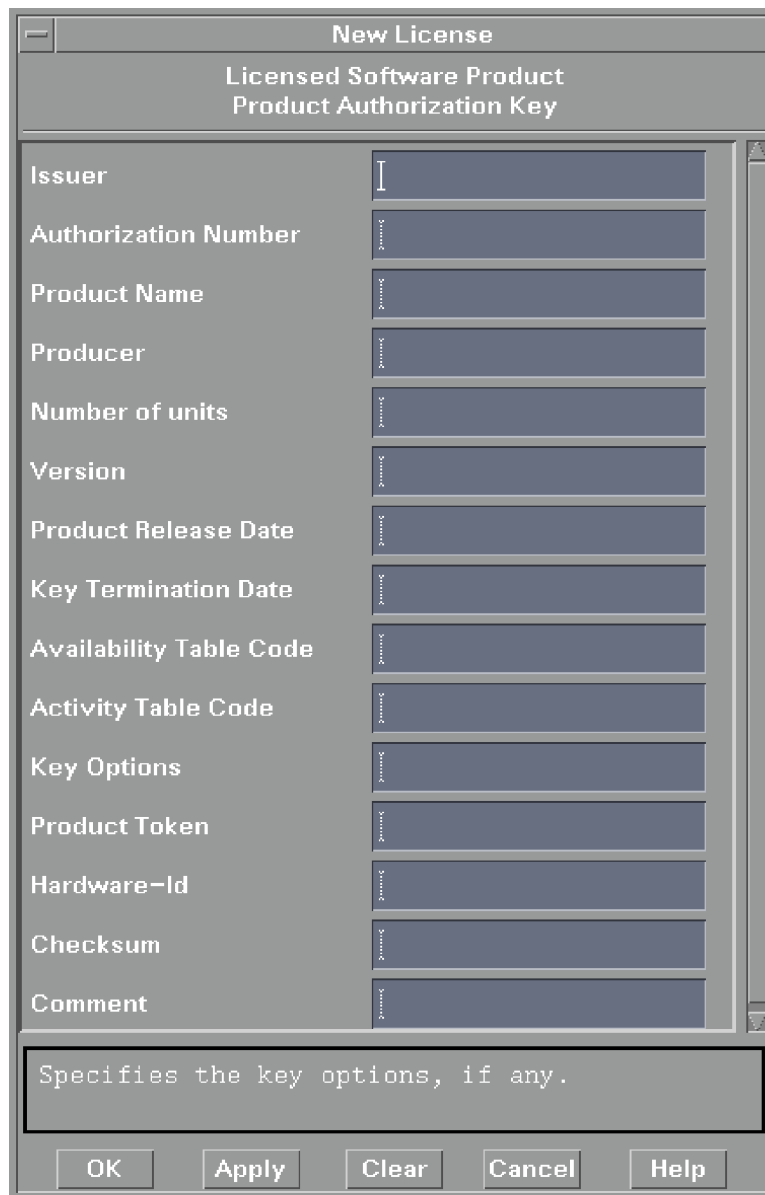
The PAKs, or licenses, that come with the Digital UNIX Operating System *must* be configured before performing any other system functions. The number of PAKs you receive will vary depending on the operating system applications you are running.

**NOTE:** The system administrator *must* configure the PAKs before any user logs in to the system.

Follow the steps below to configure the PAKs.

- STEP 1: **Log in with a sysadmin account.** Type `sysadmin` at the DII COE Login screen Name prompt and press [RETURN].
- STEP 2: **Enter the password.** Type the password at the Password prompt and press [RETURN]. The System Administration software appears with the CDE Front Panel at the bottom of the screen.
- STEP 3: **Open the Application Manager.** Click on the Application Manager control on the CDE Front Panel to open the Application Manager window.
- STEP 4: **View DII COE applications.** Double-click on the `DII_APPS` folder in the Application Manager window to open the Application Manager - `DII_APPS` folder, which contains DII COE applications.
- STEP 5: **View system administration applications.** Double-click on the `SA_Default` folder to open the Application Manager - `SA_Default` window, which contains system administration applications.
- STEP 6: **Open the SysMan Configuration Checklist.** Double-click on the `Sysman Checklist` icon to open the SysMan Configuration Checklist.
- STEP 7: **Enter your root password.** The Get Password on `<hostname>` window appears, where `<hostname>` is the name of your system. Enter the root password in the Password field and click on the OK button. If you enter the password correctly, the SysMan Configuration Checklist window appears; otherwise, you will receive a prompt to re-enter the password.
- STEP 8: **Open the License Manager.** Click on the License Manager icon. The License Manager on `<hostname>` window appears, where `<hostname>` is the name of your system.

**STEP 9: Choose to open a new license.** Select `New` from the `Edit` pull-down menu. The `New License` window appears (Figure 5).



The image shows a graphical user interface window titled "New License". The window has a standard Mac OS-style title bar with a close button. Below the title bar, there are two labels: "Licensed Software Product" and "Product Authorization Key". The main area of the window contains a list of fields, each with a label on the left and a text input field on the right. The fields are: Issuer, Authorization Number, Product Name, Producer, Number of units, Version, Product Release Date, Key Termination Date, Availability Table Code, Activity Table Code, Key Options, Product Token, Hardware-Id, Checksum, and Comment. At the bottom of the window, there is a large text area containing the text "Specifies the key options, if any." and a row of five buttons: OK, Apply, Clear, Cancel, and Help.

New License	
Licensed Software Product	
Product Authorization Key	
Issuer	<input type="text"/>
Authorization Number	<input type="text"/>
Product Name	<input type="text"/>
Producer	<input type="text"/>
Number of units	<input type="text"/>
Version	<input type="text"/>
Product Release Date	<input type="text"/>
Key Termination Date	<input type="text"/>
Availability Table Code	<input type="text"/>
Activity Table Code	<input type="text"/>
Key Options	<input type="text"/>
Product Token	<input type="text"/>
Hardware-Id	<input type="text"/>
Checksum	<input type="text"/>
Comment	<input type="text"/>

Specifies the key options, if any.

OK Apply Clear Cancel Help

Figure 5. New License Window



**STEP 10: Enter the license information for the first PAK.** Enter the appropriate information in every field for the first PAK. Table 2 provides a description for each field in the New License window.

**NOTE:** The information for these PAKs must be entered exactly as it appears on the License Certificates that come with the Digital UNIX Operating System. Some fields may be blank. If any information is entered incorrectly, the system may function improperly.

Field Name	Description
Issuer	Indicates the company issuing the license.
Authorization Number	Indicates the issued authorization number.
Product Name	Indicates the name of the software product.
Producer	Specifies the name of the software producer.
Number of units	Specifies the number of software units to be installed.
Version	Specifies the version number of the software package being installed.
Product Release Date	Indicates the product release date of the software package being installed.
Key Termination Date	Indicates the termination date of the license key for the software product being installed.
Availability Table Code	Specifies the availability table code, if any.
Activity Table Code	Specifies the activity table code, if any.
Key Options	Specifies the key options, if any.
Product Token	Specifies the product token ID, if any.
Hardware-Id	Specifies the hardware ID, if any.
Checksum	Specifies the checksum number for the license being installed.
Comment	Indicates comments appropriate to the software installation, if any.

Table 2. New License Window Field Descriptions

- STEP 11: **Save the license information about the PAK.** Click on the `Apply` button to save the information you entered about the PAK.
- STEP 12: **Enter the license information for the rest of the PAKs.** Enter the appropriate information in every field for the rest of the PAKs. Click on the `Apply` button after entering each PAK.
- STEP 13: **Exit from the New License window.** Click on the `OK` button when you finish entering all the information for all of the appropriate PAKs.
- STEP 14: **Reboot the machine.** Reboot the machine to activate the PAKs.
- STEP 15: **Proceed to the next section.** Proceed to Section 6, *DII COE Login Accounts*, if you want to log in to the system.

## 6. DII COE Login Accounts

After you install the Digital UNIX Operating System and the DII COE Kernel, predefined login accounts are available to allow you to perform functions that are described in detail in the *DII COE System Administrator's Guide*.

To use the DII COE, you must enter a login name and password. Enter any of the valid login commands described in the following sections.

### 6.1 The root Login

The `root` login is the standard UNIX `root` login. Follow the steps below to log in as `root` from the DII COE login screen:

STEP 1: **Log in as root.** Type `root` in the `Name` field and press [RETURN].

STEP 2: **Enter the root password.** Type the `root` account password in the `Password` field and press [RETURN]. The CDE Front Panel appears at the bottom of the screen.

### 6.2 The System Administration Login

The `sysadmin` login displays a menu bar of System Administration and maintenance utilities. These utilities allow the system administrator to perform various System Administration functions, such as selecting and configuring printers, managing print jobs, and closing windows; rebooting the system, mounting file systems, formatting hard drives, and initializing floppy diskettes; loading or installing segments; changing the machine ID, editing host information, setting the system time, configuring a workstation to use DNS host name and IP address resolution, setting routing configuration, and configuring NIS; and removing global data.

Reference the *DII COE System Administrator's Guide* for more information about the System Administration application software.

Follow the steps below to log in to the System Administration utility from the DII COE login screen:

STEP 1: **Log in as system administrator.** Type `sysadmin` in the `Name` field and press [RETURN].

STEP 2: **Enter the sysadmin password.** Type the `sysadmin` password in the `Password` field and press [RETURN]. The System Administration software appears.

## 6.3 The Security Administration Login

Follow the steps below to log in to the Security Administration utility from the DII COE login screen:

- STEP 1: **Log in as security administrator.** Type `secman` in the `Name` field and press [RETURN].
- STEP 2: **Enter the `secman` password.** Type the `secman` password in the `Password` field and press [RETURN]. The Security Administration software is now enabled.

## Appendix A - Processor-Specific Environment Variables and Console Flags

Locate your processor in the table below and set the appropriate environment variables and console flag commands. The processors are listed alphabetically.

Processor Type	Section Number
AlphaPC64, EB64+, EB66+, and EB164 SBCs	A.1
AlphaServer 400 Series Processors	A.2
AlphaServer 1000 and AlphaServer 1000A Series Processors	A.3
AlphaServer 2000 Series Processors	A.4
AlphaServer 2100 Series Processors, AlphaServer 2100A Series, and Digital Alpha VME 2100 Series Processors	A.4
AlphaServer 8200 and AlphaServer 8400 Series Processors	A.5
AlphaStation 200 Series and AlphaStation 400 Series Processors	A.2
AlphaStation 250 Series and AlphaStation 255 Series Processors	A.2
AlphaStation 500 and AlphaStation 600 Series Processors	A.1
AXPvme 64, AXPvme 100, AXPvme 160, AXPvme 166, and AXPvme 230 Single-Board Computers (SBCs)	A.1
AXPpci 33 SBCs	A.1
DEC 2000 Series Processors	A.6
DEC 3000 Series Processors	A.7
DEC 4000 Series Processors	A.2
DEC 7000 and DEC 10000 Series Processors	A.5

## **A.1 AlphaStation 500 and AlphaStation 600 Series Processors; AXPvme 64, AXPvme 100, AXPvme 160, AXPvme 166, and AXPvme 230 Single-Board Computers (SBCs); AXPpci 33 SBCs; and AlphaPC64, EB64+, EB66+, and EB164 SBCs**

### **Set the Console Flags**

**STEP 1: Ensure the correct Kernel file boots automatically.** Type the following command to ensure the correct Kernel file boots automatically:

```
set boot_osflags ""[RETURN]
```

**STEP 2: Set the appropriate halt command.** Type the following command to halt the system each time the system is turned on, when the system crashes, or when you press the `Halt` button:

```
set auto_action halt[RETURN]
```

**STEP 3: Ensure an alternate boot file is not set.** Type the following command to ensure an alternate boot file is not set:

```
set boot_file[RETURN]
```

## **A.2 AlphaServer 400 Series Processors; AlphaStation 200 Series and AlphaStation 400 Series Processors; AlphaStation 250 Series and AlphaStation 255 Series Processors; DEC 4000 Series Processors**

### **Set the Console Flags**

**STEP 1: Ensure the correct Kernel file boots automatically.** Type the following command to ensure the correct Kernel file boots automatically:

```
set boot_osflags ""[RETURN]
```

**STEP 2: Set the appropriate halt command.** Type the following command to halt the system each time the system is turned on, when the system crashes, or when you press the `Halt` button:

```
set auto_action halt[RETURN]
```

## A.3 AlphaServer 1000 and AlphaServer 1000A Series Processors

### Set the `bus_probe_algorithm` Environment Variable

STEP 1: **Verify that the `bus_probe_algorithm` environment variable is set to `new`.** The `bus_probe_algorithm` environment variable must be set to `new`. To verify that the `bus_probe_algorithm` environment variable is set to `new`, type the following command:

```
show bus_probe_algorithm [RETURN]
```

STEP 2: **Set the `bus_probe_algorithm` environment variable to `new`.** If the environment variable is set to `old`, type the following command to set the variable to `new` and initialize the console:

```
set bus_probe_algorithm new [RETURN]
```

```
init [RETURN]
```

### Set the Console Flags

STEP 1: **Ensure the correct Kernel file boots automatically.** Type the following command to ensure the correct Kernel file boots automatically:

```
set boot_osflags "" [RETURN]
```

STEP 2: **Set the appropriate halt command.** Type the following command to halt the system each time the system is turned on, when the system crashes, or when you press the `Halt` button:

```
set auto_action halt [RETURN]
```

STEP 3: **Ensure an alternate boot file is not set.** Type the following command to ensure an alternate boot file is not set:

```
set boot_file [RETURN]
```

## A.4 AlphaServer 2000 Series Processors; AlphaServer 2100 Series Processors, AlphaServer 2100A Series, and Digital Alpha VME 2100 Series Processors

### Set the `bus_probe_algorithm` Environment Variable

STEP 1: **Verify that the `bus_probe_algorithm` environment variable is set to `new`.** The `bus_probe_algorithm` environment variable must be set to `new`. To verify that the `bus_probe_algorithm` environment variable is set to `new`, type the following command:

```
show bus_probe_algorithm [RETURN]
```

STEP 2: **Set the `bus_probe_algorithm` environment variable to `new`.** If the environment variable is set to `old`, type the following command to set the variable to `new` and initialize the console:

```
set bus_probe_algorithm new [RETURN]
```

```
init [RETURN]
```

### Set the Console Flags

STEP 1: **Ensure the correct Kernel file boots automatically.** Type the following command to ensure the correct Kernel file boots automatically:

```
set boot_osflags "" [RETURN]
```

STEP 2: **Set the appropriate halt command.** Type the following command to halt the system each time the system is turned on, when the system crashes, or when you press the `Halt` button:

```
set auto_action halt [RETURN]
```



## A.5 AlphaServer 8200 and AlphaServer 8400 Series Processors; DEC 7000 and DEC 10000 Series Processors

### Set the Console Flags

STEP 1: **Ensure the correct Kernel file boots automatically.** Type the following command to ensure the correct Kernel file boots automatically:

```
set boot_osflags ""[RETURN]
```

STEP 2: **Set the appropriate halt command.** Type the following command to halt the system each time the system is turned on, when the system crashes, or when you press the `Halt` button:

```
set auto_action halt[RETURN]
```

STEP 3: **Ensure an alternate boot file is not set.** Type the following command to ensure an alternate boot file is not set:

```
set boot_reset on[RETURN]
```

## A.6 DEC 2000 Series Processors

### Set the Console Flags

STEP 1: **Ensure the correct Kernel file boots automatically.** Type the following command to ensure the correct Kernel file boots automatically:

```
set boot_osflags ""[RETURN]
```

STEP 2: **Set the appropriate halt command.** Type the following command to halt the system each time the system is turned on, when the system crashes, or when you press the `Halt` button:

```
set auto_action halt[RETURN]
```

STEP 3: **Set the keyboard variable to match the keyboard type on the system.** Use the `help set` command to list the available keyboard types:

```
set keyboard <type>[RETURN]
```

## A.7 DEC 3000 Series Processors

### Set the Console Flags

STEP 1: **Ensure the correct Kernel file boots automatically.** Type the following command to ensure the correct Kernel file boots automatically:

```
set boot_osflags ""[RETURN]
```

STEP 2: **Set the appropriate halt command.** Type the following command to halt the system each time the system is turned on, when the system crashes, or when you press the `Halt` button:

```
set auto_action halt[RETURN]
```

STEP 3: **Ensure all devices are initialized before rebooting.** Type the following command to ensure all devices are initialized before rebooting:

```
set boot_reset on[RETURN]
```

STEP 4: **Ensure all devices have enough time to initialize during the boot sequence.** Type the following command to ensure all devices have enough time to initialize during the boot sequence:

```
set scsi_reset 4[RETURN]
```